

FIG._1 (PRIOR ART)

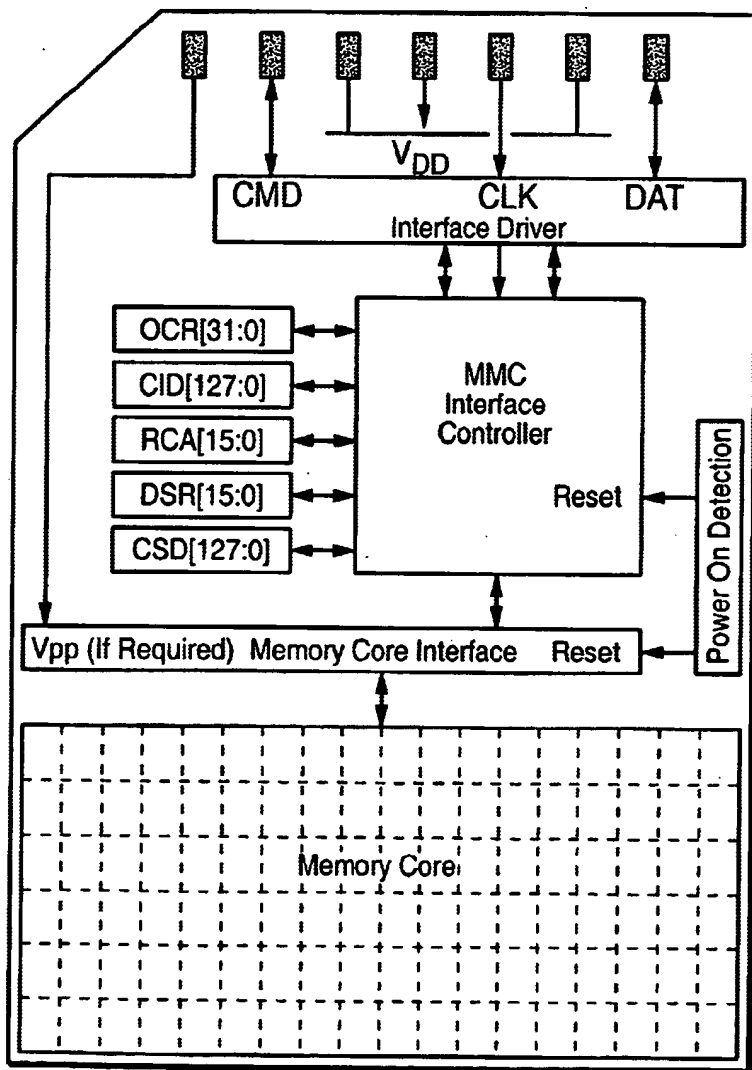


FIG._2 (PRIOR ART)

BEST AVAILABLE COPY

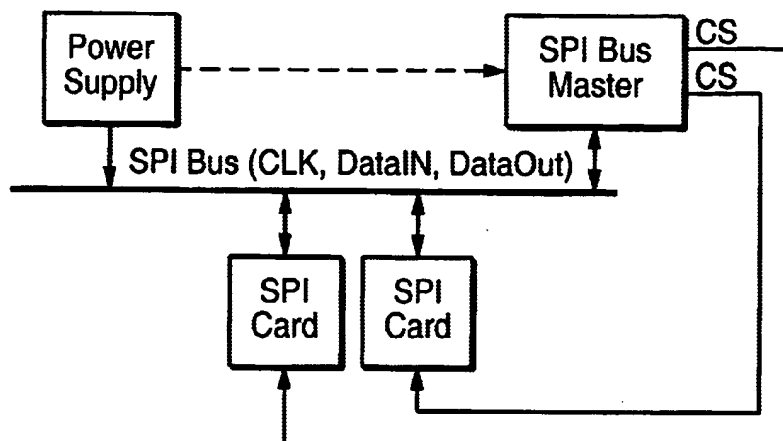



FIG._3

| Pin # | MMC | | | SPI | | |
|-------|------------------|-------------------|-------------------------|------|------|------------------------|
| | Name | Type ¹ | Description | Name | Type | Description |
| 1 | RSV | NC | Reserved For Future Use | CS | I | Chip Select (Neg True) |
| 2 | CMD | I/O/PP/OD | Command/ Response | DI | I/PP | Data In |
| 3 | V _{SS1} | S | Supply Voltage Ground | VSS | S | Supply Voltage Ground |
| 4 | V _{DD} | S | Supply Voltage | VDD | S | Supply Voltage |
| 5 | CLK | I | Clock | SCLK | I | Clock |
| 6 | V _{SS2} | S | Supply Voltage Ground | VSS2 | S | Supply Voltage Ground |
| 7 | DAT | I/O/PP | Data | DO | O/PP | Data Out |

FIG._4

3 / 5



| OCR Bit Position | VDD Voltage Window |
|------------------|--|
| 0-7 | Reserved |
| 8 | 2.0-2.1 |
| 9 | 2.1-2.2 |
| 10 | 2.2-2.3 |
| 11 | 2.3-2.4 |
| 12 | 2.4-2.5 |
| 13 | 2.5-2.6 |
| 14 | 2.6-2.7 |
| 15 | 2.7-2.8 |
| 16 | 2.8-2.9 |
| 17 | 2.9-3.0 |
| 18 | 3.0-3.1 |
| 19 | 3.1-3.2 |
| 20 | 3.2-3.3 |
| 21 | 3.3-3.4 |
| 22 | 3.4-3.5 |
| 23 | 3.5-3.6 |
| 24-30 | Reserved |
| 31 | Card Power Up Status Bit (Busy) ¹ |

FIG._5
(PRIOR ART)

| Name | Field | Width | CID-slice |
|------------------------|-------|-------|-----------|
| Manufacturer ID | MID | 24 | [127:104] |
| Card Individual Number | CIN | 96 | [103:8] |
| CRC7 Checksum | CRC | 7 | [7:1] |
| Not Used, Always '1' | - | 1 | [0:0] |

FIG._6
(PRIOR ART)

BEST AVAILABLE COPY



| Name | Field | Width | Cell Type | CSD-slice |
|--|--------------------|-------|-----------|-----------|
| CSD Structure | CSD_STRUCTURE | 2 | R | [127:126] |
| MMC Protocol Version | MMC_PROT | 4 | R | [125:122] |
| Reserved | - | 2 | R | [121:120] |
| Data Read Access-time-1 | TAAC | 8 | R | [119:112] |
| Data Read Access-time-2 in CLK Cycles (NSAC*100) | NSAC | 8 | R | [111:104] |
| Max. Data Transfer Rate | TRAN_SPEED | 8 | R | [103:96] |
| Card Command Classes | CCC | 12 | R | [95:84] |
| Max. Read Data Block Length | READ_BL_LEN | 4 | R | [83:80] |
| Partial Blocks For Read Allowed | READ_BL_PARTIAL | 1 | R | [79:79] |
| Write Block Misalignment | WRITE_BLK_MISALIGN | 1 | R | [78:78] |
| Read Block Misalignment | READ_BLK_MISALIGN | 1 | R | [77:77] |
| DSR Implemented | DSR_IMP | 1 | R | [76:76] |
| External V _{pp} | VPROG | 2 | R | [75:74] |
| Device Size Mantissa | C_SIZE_MANT | 8 | R | [73:66] |
| Device Size Exponent | C_SIZE_EXP | 4 | R | [65:62] |
| Max. Read Current @ V _{DD} Min | VDD_R_CURR_MIN | 3 | R | [61:59] |
| Max. Read Current @ V _{DD} Max | VDD_R_CURR_MAX | 3 | R | [58:56] |

| Name | Field | Width | Cell Type | CSD-slice |
|--|--------------------|-------|-----------|-----------|
| Max. Write Current @ V _{DD} Min | VDD_W_CURRENT_MIN | 3 | R | [55:53] |
| Max. Write Current @ V _{DD} Max | VDD_W_CURRENT_MAX | 3 | R | [52:50] |
| Max V _{pp} Current | VPP_CURR | 3 | R | [49:47] |
| Erase Sector Size | SECTOR_SIZE | 5 | R | [46:42] |
| Erase Group Size | ERASE_GRP_SIZE | 5 | R | [41:37] |
| Write Protect Group Size | WP_GRP_SIZE | 5 | R | [36:32] |
| Write Protect Group Enable | WP_GRP_ENABLE | 1 | R | [31:31] |
| Manufacturer Default ECC | DEFAULT_ECC | 2 | R | [30:29] |
| Stream Write Speed Factor | R2W_FACTOR | 3 | R | [28:26] |
| Max. Write Data Block Length | WRITE_BL_LEN | 4 | R | [25:22] |
| Partial Blocks For Write Allowed | WRITE_BL_PARTIAL | 1 | R | [21:21] |
| Reserved | - | 5 | R | [20:16] |
| Reserved | - | 3 | R/W | [15:13] |
| Copy Flag (OTP) | COPY | 1 | R/W | [12:12] |
| Permanent Write Protection | PERM_WRITE_PROTECT | 1 | R/W | [11:11] |
| Temporary Write Protection | TMP_WRITE_PROTECT | 1 | R/W/E | [10:10] |
| ECC Code | ECC | 2 | R/W/E | [9:8] |
| CRC | CRC | 7 | R/W/E | [7:1] |
| Not Used, Always '1' | - | 1 | - | [0:0] |

FIG. 7
(PRIOR ART)

BEST AVAILABLE COPY

| Name | Available In SPI Mode | Width [Bytes] | Description |
|------|-----------------------|---------------|--|
| CID | Yes | 16 | Card Identification Data (Serial Number, Manufacturer ID etc.) |
| RCA | No | | |
| DSR | No | | |
| CSD | Yes | 16 | Card Specific Data, Information About the Card Operation Conditions. |
| OCR | No | | |

FIG._8

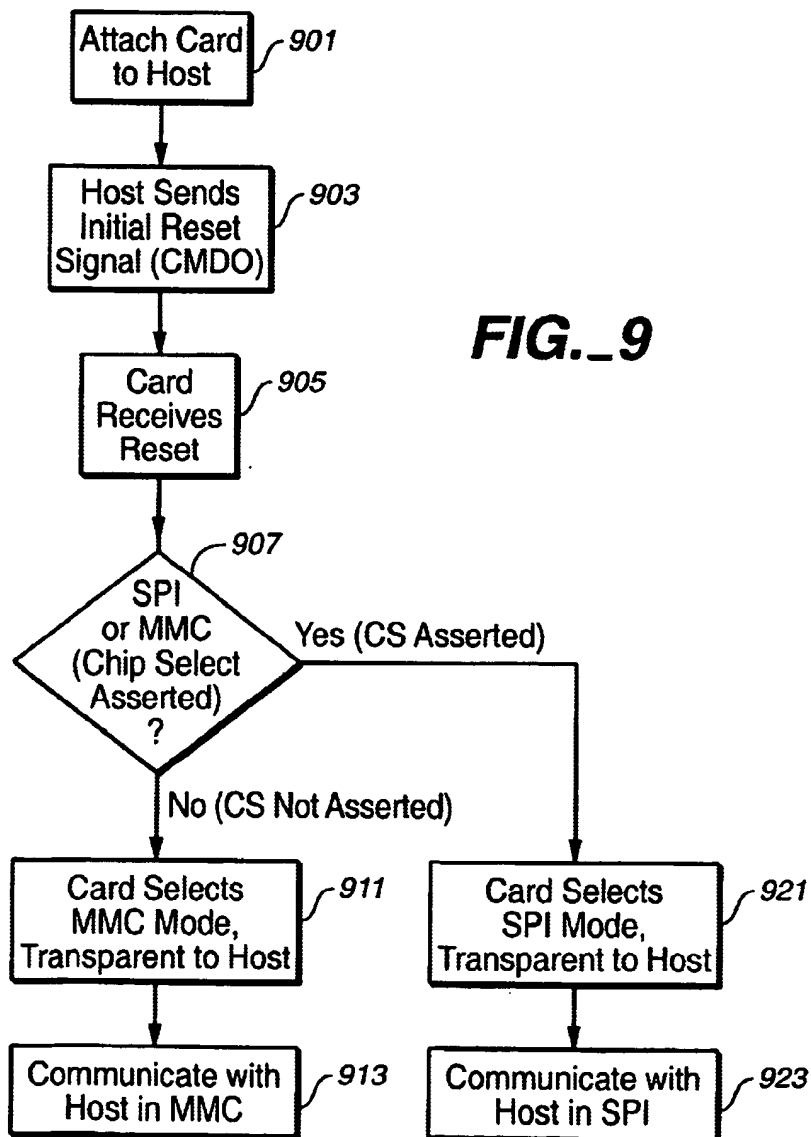


FIG._9